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A Resumé of the Present Milk Regulations (Scotland).*

By J. McAllan, M.A., B.Sc., M.R.C.V.S., Aberdeen.

For almost more years than any of us can count, the many and great problems that arise with regard to our milk supply have been discussed by societies—medical, veterinary and sanitary. That milk has been discussed with such earnestness and persistency indicates the importance of the subject and the difficulties that obviously arise in tackling its problems. The direct outcome of the scientific deliberations on any great subject such as milk, which is of such vital importance to the whole community is, as a rule, legislation, and milk certainly has had its share of legislative treatment—too big a share some think, too small think many.

The great difficulty in legislating satisfactorily (or comprehensively, shall I say ?) for the control of such a food as milk lies, of course, in the fact that so many different and conflicting interests have to be considered and consulted in the drawing up of such legislation. I mean interests on the producer's side and on the consumer's side. One might argue, of course, that the consumer should have most of the consideration, since he is a very big majority in the question. Yet, it is almost unnecessary to state that the minority, the producers, must not be crushed out legislatively and economically in the aim for ideal conditions, since that means disaster to all. In all legislation dealing with milk, then, we have to realise that the elementary economics of supply and demand, cost of production and price have their place ; so that those of us, looking only from the elevated plane of a Public Health Department (!) who may frequently have thought and even said that our milk legislation does not go far enough, must bear in mind that our law makers, who, I am sure, have always the ideal before them, have perhaps to be pitied in that they are constrained by dull economic factors in their deliberations and that no doubt they endeavour to strike the happy medium—as difficult sometimes as attaining the ideal !—between the producer's and consumer's interests.

Your Secretary wrote asking me to give to-day a paper entitled " A Resumé of the Present Milk Regulations "—a dull subject, I fear, since regulations do not lend themselves well to interesting treatment. Yet the milk regulations contain much that is of interest, and to veterinary surgeons our milk regulations, recent ones at any rate, are of great import and call for our fullest consideration. In a resumé I cannot give all—it would be no resumé—so my endeavour shall be to take the recent legislation dealing with milk, indicate the purpose of that legislation and treat of its more salient features, leaving all of you to bring forward for discussion points that may be of particular and personal interest.

Milk is treated legislatively from two angles, of course—from what one might broadly call the nutritive aspect and from the hygienic aspect, although recent legislation may combine both.

In the Sale of Milk Regulations, 1901, it is laid down that, until the contrary is proved, milk (not being skimmed or separated or condensed milk) is held not to be genuine unless it contains 3 per cent. fat and 8·5 per cent. solids other than fat.

That defines, as it were, genuine milk on a presumptive standard, and I do not propose to discuss this nutritive aspect of milk to-day. The whole question is a big one but, as a rule, it does not come under the purview of the veterinary surgeon. As a question of general interest, I would, however, recommend it to you all, for the anomalies that do arise here are very great and, indeed, interesting. From my own experience of milk analysis of both individual cows and of the mixed milk of herds, I have come to the conclusion that the physiology of milk secretion is a mystery, and that the physiology of the milk-secreting cow is an even greater mystery—so variable can analyses of similar samples from the same animals on even consecutive days, and even of the mixed milk of the same herd, be.

I shall now deal with the hygienic control of milk.

Prior to the coming into force of the Milk and Dairies (Scotland) Act in September of last year, the chief legislative measures dealing with milk in Scotland were : Contagious Diseases (Animals) Act, 1878, Contagious Diseases (Animals) Act 1886, the Public Health (Scotland) Act 1897, Sections 60 and 61 and the Burgh Police (Scotland) Act 1903, Sections 83-92. The Milk and Dairies (Scotland) Act consolidates all the powers contained in the foregoing, which are revoked.

The Milk and Dairies (Scotland) Act is the most important advance in Milk Control that this country has yet made, and it will pay us to go over its chief provisions.

Section 2 gives definitions—and here we must note that the definition of the word " dairy " is extended from that given in the Public Health (Scotland) Act 1897, to include any creamery, farm, farmhouse, cowshed, byre, milk store, milk shop or other premises from which milk is sold or supplied for sale or in which it is kept for purposes of sale, or which are used for the making of butter, cheese, or other milk products for human consumption.

*Presented to the Scottish Metropolitan Division, February 17th, 1926.

Already we have all heard or read discussions anent the extension of this definition, but, to my mind, there is no reasonable objection to the inclusion of butter and cheese makers. As handlers or producers of milk or milk-derived products for the use of the general public, they should come within the Act.

Section 3 (1) *to* (6) deals with the appointment of a veterinary inspector or inspectors to carry out the important duties imposed on local authorities by the Act—the long-delayed and very, very necessary inspection of our dairy herds. Under Section 3 (5) the Board of Health has recently issued suggested Regulations for the guidance of local authorities for regulating the duties of the veterinary inspector and his relation to the other officers of the local authority. Broadly speaking, these regulations give the local authority power to appoint the veterinary inspector, inspector not only of the cattle in the dairies but of the dairies themselves, exclusive of milk shops, and the regulations lay down the duties of the veterinary inspector if he should be so appointed, *viz.*, periodical inspection of premises and of cattle, the reporting of any disease amongst the dairy workers to the Medical Officer of Health, close co-operation with Medical Officers of Health, the keeping of records, etc. Over all, the Medical Officer of Health is the chief administrative officer and that, to my mind, is right. In such a big matter of control as this, where human and animal diseases may have to be dealt with affecting a community, an administrative head is essential.

That the veterinary inspectors should have control, too, of the actual premises is my firm conviction. I have read that we are not trained for such control. Is it worth while confuting such statements? If veterinary surgeons do not know the best conditions under which animals should be kept to safeguard the animals' health, and if veterinary surgeons trained in bacteriology and hygiene do not know what cleanness is and what cleanliness in methods of production means, who do?

I hope to see all veterinary inspectors appointed as the dairy inspectors, not with the thought that they will perform miracles in improvement, but that by a steady educative effort they will bring about what we have to admit is needed—a gradual uplifting in our methods of milk production and in the health of our stock.

Section 4 deals with inspection of premises and of cattle and gives power to officials in one district to inspect in another district if they think it necessary.

Section 5 deals with the inspection of premises and cattle which do not need to be registered, *i.e.*, premises from which only small quantities of milk are sold to persons in the employment of the occupier.

Section 7 deals with the important question of registration. It is not lawful for any person to carry on the trade of a dairyman unless he has been given a certificate of registration *in respect of the premises.* It is noteworthy that previously it was the person who was registered—an important and very necessary difference and advance.

Certificates can be refused or revoked if the dairyman's methods or his premises become unsatisfactory.

Section 8 states that every local authority must, as soon as may be after the passing of the Act, make Bye-laws for all the purposes already provided in the Contagious Diseases (Animal) Acts with extensions to include such matters as:—

(*a*) the washing and scalding facilities;

(*b*) the prevention of impurities in milk intended for human consumption; and

(*c*) the securing the cleanliness and health of the cows and the cleanliness of the persons and clothing of those employed or assisting in the business.

The Board of Health has, of course, issued model Bye-laws for the assistance of local authorities, and most local authorities are now working on these. The Bye-laws are, I consider, exceedingly reasonable, as they must be in these times, in that they do not insist so much on structual alterations as on improved methods of production. Structural alterations are certainly necessary in many cowsheds, chiefly for the sake of the cows' health, and these can generally be carried out cheaply and yet efficiently, more light and more ventilation cost little, as a rule.

In carrying out the suggested Bye-laws which deal with the improved methods, I think that we can do much to bring about improvement by educating producers, by telling a man that such and such an act contaminates his milk, how it does it and how it leads to deterioration. It is not sufficient simply to tell a man that he must not do this or that. Give him a good reason why he must alter his methods—the best of all reasons, even, that dirty milk will ultimately tell in his yearly balance.

Section 10 states that the Board can apply to the Sheriff by summary petition if a local authority neglects its duty under the Act, and *Section* 11 gives a local authority power to appeal to the Board if it has reason to believe that another local authority consigning milk to the said local authority is not carrying out the duties imposed by the Act.

Section 12 deals with the power given to the Board, with the concurrence of the Board of Agriculture, to make special orders for such purposes as:—

(1) Cooling and protecting milk from contamination or infection;

(2) Prohibition of use of colouring matter and of the addition to milk of skimmed milk or separated milk or water. (Milk and Dairies (Amendment) Act 1922).

(3) Prohibition of the use of the word "Milk" as the name of any substance not wholly derived from the mammary gland of an animal.

(4) The conveyance of milk including the proper fastening, sealing, etc., of churns, etc. (Milk and Dairies (Scotland) Order, 1925).

Section 13 is very important in that it prohibits the milk of diseased cows from being sold or used in the manufacture of products for human consumption.

This section does not merely specify tuberculosis, but other diseases of the udder or any condition that might infect or contaminate the milk.

In this connection, I might be excused if I mention infections caused by organisms of the salmonella group, fortunately rare infections to be derived from cows, but yet encountered. Twice within the last six months I had the good fortune to take part in the investigations of two food poisoning outbreaks due to milk in my district—one of them an extensive one—and in both cases organisms of the Gaertner group were recovered from the udder, flesh and fæces of a guilty cow in two herds. Might I suggest that the diarrhœa of indefinite origin found in dairy cows is worthy of your attention from the possibility of food poisoning?

Section 14 states that the dairyman must notify to the local authority any of his cows which appear to be suffering from disease that is likely to infect or contaminate milk.

Sections 15, 16, 17 deal with infectious diseases amongst dairy workers, notification to the Medical Officer of Health and the prohibition of such persons suffering from disease working in dairies.

Section 18 deals with the procedure for stoppage of milk supplies in the event of an outbreak of infectious disease in a dairy.

Section 19 states that dairymen shall produce lists, when required, of customers, and also of persons supplying them with milk. Such procedure is necessary and is usually adopted in the investigation of an outbreak of an infectious disease attributable, or thought to be attributable, to milk.

Section 20 gives power to the duly-appointed officer or officers under the Act to examine persons employed or resident in the dairy, and requires such persons to provide the Medical Officer of Health with such specimens of mucus, urine and fæces as may be required for investigation.

Section 21 gives power to take samples of milk for examination and also samples of fæces or urine, or of any abnormal discharge from any cow.

Section 22 gives power to the veterinary inspector to apply the tuberculin test, but only with the previous consent in writing of the owner of the animal.

Sections 24 *and* 25 deal with penalties for offences.

Section 28 is noteworthy in that it gives local authorities power to establish milk depôts for the sale of milk specially prepared for consumption by infants under two years of age.

Such municipalisation would be most commendable, although many local authorities have now gone a long way in attaining such a laudable end as the providing of special milk for children by advocating and assisting in every way the use of certified milk.

Such then, briefly—not briefly enough perhaps!—are the provisions of this far-reaching Act, which, if properly, reasonably and fairly worked will, I am sure, do much to improve our milk supply for the consumer, and benefit in the end, to no inconsiderable extent, the producer.

As a very necessasy complement of the Milk and Dairies Act, we have the Tuberculosis Order of 1925. It, to my mind, is first and foremost a Public Health measure and, as such, will play a valuable part in the general improvement of our milk supply. I do not say that the Tuberculosis Order is entirely a Public Health measure, for I cannot see other than that the elimination of cases of open tuberculosis will have a certain—perhaps slight—effect on the general incidence of tuberculosis in our herds. How often we all see the cow with the obviously tuberculous quarter being relegated to the task of bringing up the lonely calf. Will it not be of advantage that we prohibit that? The Tuberculosis Order, however, I do not intend to discuss further. We have already had a surfeit of discussion and correspondence on it and its working. All I would say anent that surfeit is that in many places the Order seems to me to be sadly misunderstood, and that the difficulties in its working have been greatly exaggerated. I do not mean to say that difficulties in diagnosis will not be met with but, with reasonable care, the types of tuberculosis which have to be dealt with (and, after all, it is only certain types and not all types or all reacting animals that fall under the Order) should not I think, create tremendous chaos in reasoning minds.

The next important Order at which we have to look is The Milk (Special Designations) Order, Scotland, 1923, and its amending Orders made under Sections 3 and 14 of the Milk and Dairies (Amendment) Act, 1922—an Act which was introduced to postpone for a further period the operation of the Milk and Dairies (Scotland) Act, 1914, and to make further provision regarding the sale of milk for purposes connected therewith.

The principal provisions of the Order are: Every local authority is authorised to grant licences to any person to sell milk under the following designations:—

(1) "Certified";
(2) "Grade A (Tuberculin tested)";
(3) "Grade A";
(4) "Grade A (Pasteurised)";
(5) "Pasteurised."

These licences can be granted only on payment of a specified fee, and on the conditions specified in the second schedule of the Order, which conditions apply to all the grades.

There are four schedules to the Order, in which are laid down the conditions which must govern the granting of licences.

The first schedule merely gives the form which licences for the various grades of milk must take.

The second schedule gives the general conditions subject to which licences may be granted:—

(1) As regards the first three grades, the conditions under which the milk is produced, stored, treated or distributed, must be satisfactory to the local authority on the basis of a score card issued by the Board.
(2) The holder of a licence must take steps to keep milk to which the licence applies separate from all other milk. He must permit any person

authorised by the Board or by the local authority to inspect the premises and all the processes of production: to inspect the record of milk production, etc., which he must keep and to take samples of milk.

The third schedule, Part 1, lays down the conditions for the production and sale of "Certified" Milk. These are:—

(1) (*a*) All animals in the herd must be examined by a veterinary surgeon not less than three times a year.

(*b*) The prescribed tuberculin test must be applied to every animal at intervals of six months, except that, if after two such tests with no "reactors" in the herd and when animals from already licensed herds have been added, tests shall be required only at intervals of twelve months.

(*c*) No animal except from a licensed herd shall be added to a herd unless it has passed the prescribed tuberculin test immediately before being added to the herd.

(*d*) Animals reacting to the test or showing evidence of any disease likely to be injurious to the milk must be removed from the herd or isolated and the milk must not be sold, and if the animal is removed, the owner must notify the local authority of its disposal.

(*e*) The herd shall be completely isolated from all other cattle.

(*f*) The animals of the herd must be easily identified and a register of them kept.

(2) Immediately after production the milk must be cooled and bottled on the premises, the bottles having previously been sterilised by steam, and

(3) After bottling, the bottles must be "disced" and fitted with a cap which acts as a seal and the cap bears the name of the producer, day of production, and the words "Certified Milk."

The above conditions apply specifically to producers, and the following apply to all holders of licences, *i.e.*, to the producer who may not be the retailer and to the retailer:—

(1) The milk shall not be removed from the bottles nor the seals broken before selling to the consumer.

(2) On a sample being taken at any time before delivery to the consumer, the milk shall be found to contain (*a*) not more than 30,000 bacteria per cubic centimetre; (*b*) no coliform bacilli in one-tenth of a cubic centimetre and (*c*) not less than 3·5 per cent. butter fat.

(3) The milk shall not be treated by heat.

Arising out of the foregoing, we have to note that the prescribed tuberculin test of the Board was the combined subcutaneous and ophthalmic tests, but that, in a letter to local authorities dated 29th December, the Board have now authorised the combined intradermal and ophthalmic tests as an alternative to the previously prescribed tests.

Part II. of the first schedule gives the conditions of a licence for selling Grade A (tuberculin tested) milk. The conditions are the same as for "certified" milk, except that the milk need not be bottled on the premises but can be consigned from the premises in an unventilated sealed container duly labelled.

Retailers must deliver to the consumer in bottles or in suitable containers of not less than two gallons capacity.

Grade A (tuberculin tested) milk must contain not less than 3·5 per cent. butter fat; not more than 200,000 bacteria per cubic centimetre, and no coliform bacilli in one-hundredth of a cubic centimetre.

Part III. gives conditions of licence to sell Grade A milk which is produced from cows which must be examined not less than three times in every year. If tubercle bacilli are found at any time in the milk, the producer must take steps to get the diseased animal or animals removed from the herd; no animal which has, to the owner's knowledge, failed the tuberculin test shall form part of, or be added to, the herd.

The other conditions are the same as for Grade A (Tuberculin Tested) milk.

Grade A milk (Pasteurised) shall contain not more than 30,000 bacteria per cubic centimetre and no coliform bacilli in one-tenth of a cubic centimetre.

Part IV. gives the conditions for the sale of pasteurised milk.

The milk must be retained at a temperature of between 145°-150° F. for at least half an hour and be immediately passed to an efficiently protected cooler and reduced to a temperature of not more than 50° F.

A sample of pasteurised milk taken before delivery to the consumer shall not contain more than 100,000 bacteria per cubic centimetre.

The Order just dealt with has had a very stimulating effect on our milk production in that it has led to the creation of a demand—unfortunately, not big enough yet—for milk of high grade. Producers in many parts of the country are finding it profitable to supply certified milk, and it is to the credit of many local authorities that they have helped such producers by purchasing certified milk for public institutions, such as child welfare centres and tuberculosis institutes.

We all recognise that the encouragement of production of certified milk on a scale big enough to supply all young children should be the aim of all authorities, central and local.

On the question of pasteurised milk I do not intend to dwell since I think that it is still a thorny one. Until our "nutritionists" can give us something definite to guide us we must be content to look upon pasteurised milk as, at any rate, a fairly safe guarantee against specific diseases, such as tuberculosis, but of indefinitely proved nutritional value as compared with raw milk.

Milk and Dairies (Scotland) Order, 1925. Under Sub-Section (10) of Section 7 (the Local Authority must keep a register of dairies and dairymen within their district certified under the Act in such form

as shall be prescribed by the Board), and under Sub-Section (2) of Section 12 (power given to the Board to make special orders for special purposes) of the Milk and Dairies Act, the above Order dated 31st August, 1925, was made by the Board. The most important parts of the Order are those which deal with provisions against contamination or infection. Article 5 states that no person shall transfer milk from one vessel to another vessel except on registered premises provided that if due precautions are taken to prevent the contamination of the milk by dust or otherwise the provisions of this Article (I.) shall not apply where milk is being sold by retail; (II.) shall not prevent a dairyman on his rounds transferring milk on the vehicle from one vessel to another vessel thereon.

The above, I am afraid, will do little to eradicate the unfortunate methods which prevail in the dusty streets of most of our cities, and it is these retail methods which are most in need of improvement. The problem is a difficult one and will not be solved until we have all milk bottled on the dairyman's premises and delivered to the consumer in bottles.

Article 6 prohibits the storing of milk or milk vessels in any place where they are likely to be contaminated, *e.g.*, in a byre, a dwelling-room, a sleeping apartment, or in a washing-house, etc., and in places exposed to the effluvia of pigstyes, manure heaps, cess-pools, privies, etc.

In Article 7 it is laid down that no vessel likely to contaminate milk shall be used and that no boiler or tank or other receptacle used for washing or scalding milk vessels shall be used for the washing or boiling of bed or body clothing, or for any purposes likely to contaminate milk. All these instructions would have been unnecessary and greater security given had the Milk and Dairies Act, or the Bye-laws arising from it, laid down that there should be two wash-houses on dairy premises—one for household washing and the other for the washing of dairy utensils.

Article 12 of the Order prohibits dairymen using the vessels belonging to any other dairymen, and Article 13, which does not come into force till 1st January, 1927, lays down that consignors of milk by transit shall have their names and addresses permanently marked on the containers and these containers must be provided with a lid without openings so constructed as to prevent the access to the milk of dirt, dust or rainwater.

Article 15 is important in that it lays down that all containers must be sealed by a leaden seal or locked. This Article came into force on 1st January, 1926.

Article 16 states that from and after 1st January, 1927, no person shall retail skimmed milk, separated milk or cream except from vessels properly and legibly labelled.

The Order will, to my mind, be very useful, chiefly in its dealings with the transit of milk by rail or carrier.

I shall deal very briefly with two other Regulations dealing with milk, viz., The Public Heath (Condensed Milk) Regulation (Scotland), 1923, and the Public Health (Dried Milk) Regulation (Scotland), 1922.

The first lays down that condensed milk must be contained in a tin or other receptacle which must be labelled in a prescribed manner indicating the nature of the condensed milk, *e.g.*, full cream milk, unsweetened, containing the equivalent of so many pints of milk; condensed full cream milk, sweetened, containing the equivalent of so many pints of milk with sugar added, etc.

In addition, it is laid down that all condensed milk shall contain not less than the appropriate percentages of milk fat and milk solids for the different classes of condensed milk.

	Percentage of milk fat.	Percentage of all milk solids including fat.
e.g., Full cream unsweetened	9%	31%
Full cream sweetened ...	9%	31%
Skimmed unsweetened ...	—	20%
Skimmed sweetened ...	—	26%

The Public Health (Dried Milk) Regulation (Scotland) deals in a similar way with dried milk by laying down the percentages of milk fat which various dried milks must contain, *e.g.*, dried full cream milk must contain not less than 26 per cent., dried three-quarter cream milk not less than 20 per cent. and so on.

Every tin must be properly labelled stating the equivalents in pints of milk.

The whole object of these two regulations is to give the public a guarantee as to purchase and to indicate those milks, condensed and dried, which might be unfit for feeding babies were no such guarantee given and stated.

Both regulations were badly required, for they serve a most necessary and useful purpose.

That, then, is my resumé of our recent Milk Regulations. That it is a resumé or summary, I myself doubt, for I find that, in going through legislative measures, it is very difficult indeed to summarise in the strict sense of the word or in such a way as to give a full and true idea of most measures. Where all is important from the administrative aspect, it is necessary, I think, to do as I have done—take the various sections *seriatim* rather than attempt to co-ordinate them all into a connected story, as it were.

Discussion.

Mr. D. S. Rabagliati, Edinburgh, who, in the absence of Mr. A. Gofton, opened the discussion, said: I fully share your disappointment in learning that we are not to hear Mr. Gofton's remarks in opening this discussion, but I feel it a great honour that I, as one of the newest members of the Scottish Metropolitan Division and a very recent worker in the realms of Veterinary Public Health in Scotland, should be called upon to replace him. I am sure that no one knows more on this subject than Mr. Gofton, and few have a more lucid manner of imparting what they do know; I fear, therefore, that any remarks of mine will fall far short of what you came here expecting to hear.

I should like to congratulate Mr. McAllan on his paper, which I think is very much to the point, and the subject

matter is well selected, for he keeps within the scope of his title and leaves criticism of the regulations to others. He expresses fear that his subject is a dull one, but I, for one, can assure him that I have not noticed any "dry" part of his paper, with the exception, perhaps, of his remarks on the "dried milk" regulations which he tactfully relegates, in a few well chosen words, to the end. As the opener of the discussion, I hope Mr. McAllan will allow me to amplify certain points upon which he has touched and to bring forward others, to which, probably from lack of time, he did not allude—at the same time, adding a few criticisms of the regulations here and there.

In the first instance, I think that he might have brought out more clearly that there is no real legal standard for milk and that, in the 1914 and 1922 Acts, no attempt has been made to formulate one. The figures given in the Sale of Milk Regulations to which he refers, *i.e.*, 3 per cent. of fat and 8·5 per cent. of non-fatty solids, are approximate only, as it is assumed that genuine milk should not fall below this standard. If milk should contain either less fat or other solids than above stated, the onus of proof that the milk is genuine is on the dairyman—producer or retailer as the case may be. Whether a legal minimum should be constituted, below which genuine milk should never fall, is open to grave doubts, and opinions on this point are divided. This leads me to consider whether greater control could not be exercised over the proper mixing of milk before bottling by retailers. The consumer has, in recent years, largely demanded that milk should be supplied to him in bottles and, as this preference is growing, it seems probable that at no very distant date practically all milk will be retailed in this manner, except perhaps in the case of consumers who take only very small quantities. This bottling, with the exception of "Certified" and occasionally "Grade A" milk, is rarely carried out by the producer at the time of milking, but by the retailer. The milk is received from the farms in large churns and is often poured into the bottles after only very imperfect mixing, even after it has stood for some considerable time as is necessary when it is brought from a distance. The result is that certain purchasers of a pint or a quart bottle are lucky and get a milk very rich in butter fat, while others are unlucky and obtain what may be but little better than skimmed milk. Tests which I have seen carried out have proved that by the daily examination of a bottle of milk from one shop—just as it would be delivered at the consumer's door—variations in fat-content from well over 5 to under 2 per cent. have occurred. Prosecutions have been successful when milk has been poor due to improper mixing, but they are difficult to obtain and may easily fail. Where milk is bottled on a farm immediately after mixing and passing through a cooler, this is not so likely to occur, for there is hardly time for the cream to rise, even though it is surprising with what rapidity it does so; and, later on, however long the bottles are kept before delivery to the consumer, each bottle contains the fat that the cows actually gave. Nevertheless, I am fully aware that even by immediate bottling we cannot expect an absolutely uniform sample in all bottles filled at the same milking. To compel all producers to cool and bottle their own milk on the farm might be the ideal way, but practical difficulties such as cost, transport and so on make this quite impossible, at least in the meantime. The fixing of a legal standard for milk would probably bring home to the retailers the necessity for careful mixing better than anything else, as they would then have no loophole on which to rely if any of the bottles were proved to be below standard. While on the subject of bottles, I think that there should be more care taken to manufacture bottles of uniform capacity which might be marked by a line and stamped. This would ensure purchasers really obtaining the quantity of milk they paid for and, at the same time, it would assist the dairyman by preventing him from being too lavish in his measure.

In the case of Section 2 of the Milk and Dairies (Scotland) Act, 1914, which deals with who should and who need not be registered as a "dairyman," there seems to have been some difficulty in deciding who actually need not be so registered. The Scottish Board of Health have just issued a circular on this point and quote the cases of small farmers, crofters, shepherds and so on who keep one or even more cows for feeding their calves, and who may at some time of the year make and sell butter or even cheese from their surplus milk. They appear to consider that such must be considered as "dairymen" within the meaning of the Act and thus ought to be registered; even although the Board agree that a similar individual who happens to sell his surplus milk whole, need not be so registered—surely a rather peculiar distinction! They, however, recommend the lightening of the burdens imposed on such a "dairyman" by excusing him from altering his premises to meet the requirements of the dairy bye-laws as enforced on regular producers of milk. The Board also hold that in cases where only one cow is kept from which occasionally whole milk (and presumably not butter, although they do not say so) is sold, no registration is called for under the Act, but, if two or more cows are kept, the case cannot be settled on general terms and they then state as follows: "The Board are disposed to suggest that where more than one source of supply is available, the sale of milk from two cows or more would generally call for registration." I find it difficult to understand exactly what they mean by this phrase, but perhaps some other speaker will be able to enlighten us.

I am at one with the essayist in his remarks on the great advantage to be derived from having regular veterinary inspection of cows and, when the Board think advisable, by a whole-time officer. I agree with him that it is greatly to be desired that this official should have control over the premises as well as over the milch cattle. It must be noted that the appointment of the official is subject to the salary offered being considered adequate by the Board, but they have no other jurisdiction over the appointment of the officer, although he cannot be dismissed without their consent. These conditions are all in the favour of the whole-time man but, unfortunately, they do not seem to apply to the part-time inspector. A point to be emphasised in Section 4 is that it is not compulsory to inspect cows more than once a year. Such an interval is manifestly totally inadequate, but no doubt local authorities will arrange for more frequent visitations wherever possible and, taking into consideration local conditions, it would probably not be feasible to insist on more frequent inspections, at least at the present time. The power of one

official to inspect cattle in another's area is new, but it may be noted that this does not extend to the medical inspection of the dairy staffs by a medical officer, although Section 18 gives power for the medical officer of one district, if he suspects milk from another to be causing disease in his district, to notify the medical officer of the second district, who then must inspect the staffs of the suspected dairy and, if necessary, be accompanied by his veterinary inspector to examine the cows. In such a case the medical officer of the first district is entitled *to be present* at this inspection and to be accompanied by his veterinary inspector if desired, but apparently under these circumstances they cannot actually do the inspections. Presumably in the Border districts it would not be possible for the Scottish inspector to inspect the cattle on the English side of the Border, even if known to be diseased.

A point on which stress may be laid arises in Section 7, dealing with registration. Prior to the 1922 Amendment Act, registration was really automatic, and no person could be removed from the list nor premises closed. The 1922 Act gave power to remove retail vendors if unsuitable, but the 1914 Act enables the licences of both wholesale and retail dairymen to be revoked if either the person or his premises are deemed unsuitable for the trade. It is also permitted to grant provisional licences conditional to the holder carrying out any improvements specified.

In Section 12, Sub-Section 2 (c), it is laid down that the Board, with the concurrence of the Board of Agriculture for Scotland, may make an order for the prohibition of the use of the word "milk" as the name of any substance not wholly derived from the mammary gland of an animal, when such substance is offered for sale. This power, taken together with the inclusion of cream, skimmed milk, separated milk and buttermilk under the term "milk" in Section 2, is the nearest approach to the definition of "milk" that we have yet had in legislation.

Section 13, making it an offence for a dairyman to sell for human food—"either as whole milk or to be used in the manufacture of products for human consumption—milk from a cow which is suffering from tuberculosis with emaciation or from tuberculosis of the udder or from any sore on the teats accompanied by suppuration or bleeding or from any disease which is liable to infect or contaminate milk or from any cow which is giving tuberculous milk, unless he proves that he did not know and had no reason to suspect that the milk was the milk of such a cow," appears to me to be rather too rigid, except insofar as it applies to tuberculosis. From the limited experience which I have had of the working of this Act, it seems to me that is practically impossible to carry this out and it would have been better to give the veterinary inspector some discretion as to what milk should be totally rejected and what used. The obligation on the owner to notify such conditions is specified in Section 14, although very few dairymen seem to realise what this paragraph really means and, were all such ailments actually reported, the veterinary inspector would indeed have a busy time. To my mind, it would have been better to separate the conditions laid down for tuberculosis from those for cows suffering from the other conditions named, and place each in a separate section or paragraph. The maximum penalties specified for an infringement of either of these regulations, *i.e.*, using milk from such cows or failing to report such conditions, is a fine of £10 and a possible £5 per day for every day during which the offence continues, along with the possibility of the offender having his licence cancelled. It is interesting to note that under Section 5, Sub-Section 2, of the Milk and Dairies Amendment Act, 1922, the penalties for selling tuberculous milk are laid down as a maximum fine of £20 for the first offence and, for the second or subsequent offence, a fine of up to £100 or up to six months' imprisonment, with or without hard labour, or to both; though it is to be noted that an offender's licence in the case of a producer could not be revoked. Presumably a defaulting dairyman could be charged with the offence of selling tuberculous milk under either of these Acts, or for failing to notify, at the discretion of the Local Authority.

I think that Mr. McAllan is wise in saying so little about the Tuberculosis Order, for, as he rightly says, it has been discussed times without number and only indirectly concerns the subject of this paper.

Mr. McAllan describes the Milk (Special Designations) Order of 1923 at some length but, I think, passes over the Milk and Dairies (Amendment) Act in too cursory a manner. He might have pointed out that in the 1914 Act there was no power to make orders for the grading of milk and had this 1914 Act not been postponed, and the Amendment Act been introduced, we very likely, even to-day, would have no graded milk. In any case, a new Act empowering the Board to make orders would have had to be introduced. The framing of the Milk (Special Designations) Order is open to great criticism, such as regards the terminology used, which is most confusing to the public who really do not seem to know one grade from another, the difficulties of handling graded milk and the insufficient precautions against fraud. In fact, if a retailer chooses to sell ordinary milk as "Graded," or in any other way wishes to evade the regulations, the only penalty possible under the Order is to cancel his licence to sell "Graded" milk—surely a very great oversight and one liable to bring great discredit on the whole system. Possibly the producer whose "Graded" milk is brought into disrepute, or the purchaser who does not get that for which he is paying, might bring actions for damages against the defaulter, but not under the Order. There is no doubt that this Order is a step in the right direction and only requires to be tightened up and amended so as to be a most useful means of generally improving the milk supply of the country. While on this subject, I hope that I may be allowed to mention that this is the second year that the Edinburgh Public Health Committee have instituted their "Clean Milk Competitions," which are open to all dairymen-producers in the city, other than those holding certificates for graded milk. It has been remarkable to me to see the keenness shown by the competitors and their genuine desire to improve their methods of production so that each bacterial count taken of their milk may be better than the last. There is no doubt that encouragement of this sort is much to be preferred to legislation which, unfortunately, we are still not sufficiently Utopian to do without.

The 1922 Act is, of course, still operative to-day and has in no way been affected by the re-introduction of the 1914 Act. It includes several new conditions, such as the keeping of special registers for wholesale and retail dairymen;

as already mentioned, it provides for the grading of milk; it makes provision for the making of Orders concerning imported milk; for condensed, dried and skimmed milk; for the prohibition of colouring milk or of adding water, skimmed milk or condensed milk to milk. It also allows an employé to be prosecuted instead of his employer in certain instances.

Mr. McAllan refers to the condensed and dried milk regulations, but omits to refer to the Sale of Milk (Scotland) Regulations of 1914. These are made under the Sale of Food and Drugs Act, 1899, read in conjunction with Section 4 of the Small Landholders (Scotland) Act, 1911 and give a presumptive standard for the sale of skimmed and separated milk of 8·7 per cent. of milk solids other than milk fat. There is no requirement that any fat should be left in the milk at all; in fact, should even as much as 1·5 per cent. of fat be left, it would be liable to reduce the total solids other than fat to below the required minimum.

The subject is so wide that the more one considers it the more points arise in one's mind, but I trust that the few that I have raised will stimulate others to put forward their views and that Edinburgh will show its appreciation of Mr. McAllan's efforts by giving him a good discussion to which he may reply; for the best thanks we can give him is a good and free discussion.

Mr. HUGH BEGG, Hamilton; I wish to express my pleasure in listening to the reading of Mr. McAllan's paper. It seems to me that on this as on the last occasion that I listened to Mr. McAllan, he has shown a marked leaning towards the legal aspect of his subject, and that the paper we have just heard might have been written by a Town or County Clerk.

I would have been glad if he had thought fit to deal with some of the many problems that daily beset the veterinary inspector in the conduct of his work under these legislative measures and taken the opportunity which the occasion affords of getting responsible replies to some of them from Colonel Leighton.

Take, for example, the unnecessary ambiguity of Article 5 (2) of the "Milk (Special Designations) Order (Scotland), 1923," and the confusion this causes if one is to interpret strictly the definitions of "Examination of an Animal," "Veterinary Surgeon's Certificate," and "prescribed tuberculin test," as set forth in Article 2 (1) of the Order. Article 5 (2) says, "Before granting a licence to a producer, the Local Authority shall require him to produce a veterinary surgeon's certificate showing the results of an examination of the herd (or, in the case of Grade A Milk, of the milch cows belonging to the herd) carried out within one month before the date of the application and, in addition, in any case in which the conditions of the licence if granted would include the prescribed tuberculin test a certificate of a prescribed tuberculin test of the herd carried out within a period of three months."

It may be that the Board's intention in this clause agrees with my interpretation of it, which is strictly based on the definition in Article 2, but I have some proof that others may take a different meaning from it. The Medical Officer of Health in Lanarkshire has decided to grant a licence initially on the examination and certificate of any veterinary surgeon, and in any case in which the conditions of the licence require the use of tuberculin he will accept the certified chart of the test applied by any veterinary surgeon, provided it includes the two tests that constitute "the prescribed tuberculin test" required by the Board of Health.

This interpretation is held to receive support from the definition given to "Veterinary Surgeon" in Article 2. "Veterinary Surgeon" means a member of the Royal College of Veterinary Surgeons. But consider now the following definitions:—

> "Examination" of an animal means a clinical examination carried out in such a manner as the Board may direct by a veterinary surgeon *nominated* by the Local Authority, and "Veterinary Surgeon's Certificate" means a certificate, in a form approved by the Board, signed by the person who has made the examination and certifying the result thereof.
>
> "Prescribed Tuberculin Test" of an animal means a test made with tuberculin in such manner as the Board may direct by a veterinary surgeon *nominated* by the Local Authority, and "certificate of a prescribed tuberculin test" means a certificate, in a form approved by the Board, signed by the person making the test and certifying the result thereof.

I agree with Mr. McAllan in his opinion that the veterinary surgeon ought to be the judge of the conditions under which animals should live, but, unfortunately, the Medical Officer of Health and Sanitary Inspector have taken over this job in some important counties. The weakness of this position will stand revealed, I suppose, in the near future, but meantime this state of matters continues.

Regarding the fat content of milk, it may interest you to know that although hundreds of samples have been taken from our many graded herds in the last three years, I can only recall one report that showed a percentage under the required standard of 3·5 per cent. The average of all these samples is close up to 4 per cent., and the number taken in each quarter of the year is approximately the same. I was wondering to what extent the requirements of Clause (f) of Article (1) of Part 1 of the 3rd Schedule to the Order are being carried out. It says:—

> "A suitable system shall be adopted for the marking, for purposes of identification, of the animals in the herd and a complete register of such animals shall be kept."

As showing the need for supervision by inspectors, it could be proved that at one time a firm in the West advertised for sale in the public press and extolled the virtues of "Grade A Pasteurised Milk," at a time when they were not in receipt of any "Grade A Milk." It is also worthy of remark that the big firms who pasteurise milk in their modern expensive outfits are taking every precaution to preserve the cream line in their bottled pasteurised milk, knowing that the consumer looks for it and does always get it in raw milk. I am quite satisfied that to gain this objective they keep the temperature two or three degress below 145°, knowing that when it reaches beyond 146° the cream line is increasingly dissipated. It cannot be contended that the bacillus tuberculosis is efficiently destroyed under such conditions.

Our thanks are due to Mr. McAllan, and I trust you will excuse the random character of my remarks.

Mr. W. WALLACE PEGGIE, Biggar, desired to thank Mr. McAllan for his able paper and to say how he had enjoyed

listening to it. There was one flaw in the Milk (Special Designations) Order which was of great importance. It concerned reacting animals. When thirty cows were tested and twenty-five gave a negative result and five a positive reaction, what happened to the five? The farmer was advised to get rid of them through the market. Mr. Peggie considered that all cows which gave a positive reaction to the tuberculin test should be branded forthwith, to prevent the very great danger of these cows being sent from market to market, and possibly leaving a train of infection behind them.

Mr. BEGG pointed out that private practitioners had really the command of these cows, because they tested out the various herds in the first place.

Dr. SIMPSON, of Gracemount, wished to thank those who had already spoken, and to say how much he had enjoyed the discussion. He would like to emphasise the question of the standardisation of the size of bottles for certified milk. He had found that a large number—in fact, the majority—of the bottles he purchased, were well above their reputed capacity, and in a large producing dairy the extra amount of milk required to fill these bottles came to a very considerabe figure during the course of a year.

Colonel GERALD LEIGHTON, of the Scottish Board of Health, said that the whole question of milk regulation reminded him of two people gazing upon the same landscape—a landscape where in the near foreground was a pretty little cottage and a garden full of flowers, while behind it, away into the distance, stretched rolling country edged by great mountains. One person looked at the immediate foreground; the other far beyond. The former was very apt to miss the permanent lasting things by fiddling with the flowers. Some of the gentlemen who had spoken had criticised the framing of some of the Orders made by the Board of Health. He had come expecting to hear the Scottish Board criticised, maligned and miscalled, and he had not been disappointed! To some of those who had spoken calling for amendment he would say: "Take the long view; visualise the permanent things." He would like to remind them that twenty years ago there was little or no milk regulation. Twenty years ago milk was milk—simply milk, and that was all! Nowadays, of course, as everyone knew, milk was anything, but it was not simply milk. But the important thing was that the public was slowly realising certain things about milk, and especially that certain kinds of milk were better than others; that alone was a great step in the right direction.

He would like to add that the general policy of the Board of Health in matters of milk was one of slow but sure advance. Three years ago saw a new phase, but only a phase, of a question which perhaps might not be really solved in twenty-three years. He would remind the members that probably there might be no more call for new acts for twenty-five or even for fifty years, and that fact had to be borne in mind when the Board were legislating the measures now in force. They had laid down general principles along which all departments concerned might work together. Alterations would be made gradually when and where they were necessary. Their aim was to effect a gradual improvement in the milk, so that it could be relied upon as a sound food. He was confident that the various regulations had done good, were doing good, and would continue to do good, and that they would eventually land them at that point at which they all hoped to arrive—healthy cows, healthy milk and healthy human beings.

THE REPLY.

Mr. MCALLAN, in reply, stated there was very little for him to say. Mr. Rabagliati's paper was really the complement of his own, and the two of them together had really more fully discussed the legislation with regard to milk than could have been done in a resumé. He had to thank Mr. Rabagliati very sincerely for his excellent addition to his own paper.

He was disappointed to see that some members were inclined to take up little quibbling matters with regard to the legislation instead of taking, what had been so firmly and delightfully urged by Dr. Leighton, the "long view" on this question of milk. Our legislation was certainly not perfect, but Mr. McAllan was firmly of opinion that, if reasonably and sensibly utilised, our legislation would go a long way to help in the improvement of our milk supply.

In conclusion, he had to thank the members for the very patient hearing they had given him in the reading of his paper and the very good discussion that had taken place on it.

Veterinary Inspectors.

PERTHSHIRE COMMITTEE AND THE BOARD OF HEALTH.

At a meeting of the Perthshire Executive Committee under the Diseases of Animals Acts held on April 2nd, a letter was read from the Scottish Board of Health, with regard to the appointment of veterinary inspectors in the county under the Milk and Dairies (Scotland) Act, 1914, stating that the Board were prepared to approve part-time appointments for the districts and burghs of Perthshire, subject to the reservation that the whole position might be reviewed if experience showed that the Milk and Dairies Act was not being properly administered by the employment of part-time veterinary inspectors. The Board would not press for the usual undertaking by the veterinary inspectors concerned that they would not practise among the owners of dairy cows in burghs.

The Chairman said that was one of the most satisfactory dealings they had ever had from a public department, and he thought it was their duty to thank the Department. Other counties had "tumbled" to the appointment of a whole-time man. They put forward a recent argument for allowing them to try their system, and they were perfectly frank with the Board of Health that if their system failed they would do whatever the Board told them to do. He believed they were right, and it would depend upon how the veterinary surgeons carried out their duties. If they did not carry out their duties, their appointments would be of very short duration. There would have to be no slacking. They looked to the veterinary to support the local authority to get the very highest efficiency and the best results.

It was decided to defer the appointments of inspectors until it was seen what the District Committees proposed. It was recommended, however, that the inspectors carrying through the provisions of the Tuberculosis Order should also be appointed to carry out the provisions of the Milk and Dairies Act.—*Glasgow Herald.*

Foot-and-Mouth Disease.

Sir John M'Fadyean's Report to the Royal Agricultural Society of England.

The following Report by the Principal of the Royal Veterinary College was submitted to the Council of the Society at their meeting on Wednesday, March 31st :—

The number of outbreaks of foot-and-mouth disease confirmed during each of the last five years was as follows :

Year.	Outbreaks.	Animals slaughtered as Diseased or Suspected.
1921	44	3,085
1922	1,440	55,599
1923	1,854	125,098
1924	1,440	88,726
1925	260	19,963

Tables I. and II. show the dates of the outbreaks in 1925 and the counties in which they occurred.

No outbreaks were reported in the interval between May 9th and the end of June, and there were three shorter periods during which the country appeared to be free from the disease.

TABLE I.

Week ended	Jan. 17	Jan. 31	Feb. 14	Feb. 21	Feb. 28	Mar. 7	Mar. 14	Mar. 28	April 25	May 2	May 9	July 4
Nottingham	1											
Sussex, E.		4							1	1	1	
Northampton			1									
Norfolk				1								
Warwick				3	1						1	
Worcester					1							
Chester						1	1				1	
Isle of Wight ...							1					
York, W. Riding ...								1				
York, E. Riding ...												1

TABLE II.

Week ended	Aug. 1	Aug. 21	Sept. 26	Oct. 3	Oct. 17	Oct. 24	Oct. 31	Nov. 7	Nov. 14	Nov. 21	Nov. 28	Dec. 5	Dec. 12	Dec. 19	Dec. 26	Dec. 31
Southampton	2	1												1		
Buckingham			1													
Dorset				2												
Sussex, E....					1	1	1		1							
Chester						1	2									
Lancaster						12	32	9	5	2		1	1		2	
Wiltshire						10	11	10	5	6	4	3	2		1	1
York, W. Riding ...						5	5	3	2		1		1			
Leicester							2	4	2	3	3		1			
Northampton							4	2	1							
Rutland							2									
Warwick							6	1	1	1						
Derby								3	2		1	1		1		
Essex								1		2					1	
Oxford								1		1	1	1				
Gloucester									1	4	1	3	2	1		1
Stafford									2		5	5	3	2	3	3
Berkshire											1					
Lincoln											2					
Glamorgan											1					
Sussex, W....												1				

During the last four years the amounts paid in compensation for animals slaughtered in connection with outbreaks have been as follows :—

	£
1922	803,529
1923	2,209,781
1924	1,389,696
1925	270,000*

* The figures for 1925 are approximate only.

In the preceding annual report reference was made to the question whether the stamping-out method of dealing with outbreaks, which has been consistently followed in this country during the last thirty years, has been justified by the results ; and, by way of answer to the question, statistics were given to show, for comparison with those in Great Britain, the number of outbreaks in the nearest countries of Europe in 1923 and the first nine months of 1924. For the same purpose, it has been thought well to include in the present report the following figures † (Tables III. and IV.) for the years 1924 and 1925. The number of animals attacked with the disease in foreign countries has not been obtainable, and it is important to notice that the figures given in the Tables are those of outbreaks.

TABLE III.

Month, 1924	Great Britain	Germany	Holland	Belgium	France	Denmark
January ...	582	1,897	211	436	2,181	2
February ...	308	2,188	369	500	1,697	16
March ...	215	2,838	2,397	755	1,633	26
April ...	65	1,148‡	4,746	1,172	936	23
May ...	33	1,124	9,419	1,506	754	10
June ...	59	1,224	14,914	1,654	1,012	2
July ...	73	1,710	22,581	3,016	2,426	5
August ...	57	3,363	20,692	5,116	3,326	6
September	9	3,749	7,757	4,835	1,945	14
October ...	16	4,961	3,420	7,166	2,020	122
November...	19	5,985	1,224	6,318	1,057	1,383
December ...	4	6,112	1,200	4,813	825	6,332
Totals ...	1,440	36,299	88,930	37,287	19,812	7,941

TABLE IV.

Month, 1925	Great Britain	Germany	Holland	Belgium	France	Denmark
January ...	5	3,710	625	1,237	922	8,050
February	7	2,286	239	395	613	7,862
March ...	4	1,548	145	253	505	6,491
April ...	2	1,448	275	182	692	4,061
May ...	3	1,171	923	164	620	2,941
June ...	—	2,007	2,243	138	1,000	2,609
July ...	1	3,712	4,491	157	1,641	2,960
August ...	3	3,914	7,521	112	1,999	3,542
September	3	2,643	7,823	57	2,351	3,658
October ...	96	2,639	4,307	85	3,217	5,108
November...	101	2,483	1,205	103	2,044	3,781
December	35	5,011	1,042	125	1,391	2,554
Totals ...	260	32,572	31,039	3,008	17,004	53,617

It is obvious that these figures do not directly provide all the information necessary for a close comparison of the loss inflicted by the disease on each of the countries, first, because they do not show the number of animals attacked, and, secondly, because in the continental countries, where the slaughter policy is not in force, no compensation falls to be paid by the State. Fortunately, however, there are indirect methods by which one may form an estimate of the loss sustained by each country.

Facts that have to be noted at the outset are : (1) that the number of outbreaks in this country during the two years included in the above Tables was 1,775, (2) that the total number of animals slaughtered as diseased or suspected in connection with these outbreaks was 121,880 (an average of 68 per outbreak),

† Supplied by the Ministry of Agriculture.
‡ Figures incomplete.

and (3) that the total amount paid in compensation was £1,659,696 (an average of £15 per head).

Turning now to Tables III. and IV. it will be seen that during the same two years the outbreaks in Belgium numbered 40,295, and, if one allows thirty animals for each outbreak (instead of sixty-eight in Great Britain), the total number attacked must have been approximately 1,208,850.

The loss falling upon the owners of these animals includes, first, the actual deaths, and, secondly, the deterioration of value in the animals that recovered. With regard to the first of these, it has to be observed that two opposed and equally erroneous opinions appear to be widely held in this country at the present time, the first being that foot-and-mouth disease is usually fatal, and the second that all animals recover from it. The fact is that the death rate varies from 0 to 50 per cent. in different outbreaks, depending upon the nature of the animals (young or old, breeding or non-breeding), the care bestowed on them, and, above all, the virulence of the disease. Wide experience gained during the forty years when the disease prevailed in this country placed the death rate at 3 per cent., but in many parts of Europe during recent years the disease appears to have been of a specially virulent type, and probably 5 per cent. would be a fairer estimate. If, however, it is estimated to have been only 3 per cent., that would mean the actual death from the disease in Belgium of 36,264 animals during 1924 and 1925 ; and if these are valued at £10 per head (instead of the £15 found to be the value of the animals slaughtered in Great Britain) that makes the loss from deaths £362,640. To that there falls to be added the loss from deterioration in the condition and value of the animals that recovered, which at £3 per head amounts to £3,517,758.

Estimated in this way, the total loss which the disease caused to stockowners in Belgium in 1924 and 1925 amounted to £3,880,398. In the same two years the amount paid in compensation for animals slaughtered in this country was £1,659,696.

Anyone can easily estimate in the same way, for himself, what was the probable loss which the disease caused in the other countries included in the Tables, but the case of Denmark requires special notice.

Denmark is the country that most closely resembles Great Britain in matters connected with foot-and-mouth disease. For the most part the country stands detached from the Continent, and on that account it has, like Great Britain, until lately escaped with comparatively little loss from the great wave of outbreaks that has swept over nearly the whole of Europe.

Until towards the end of 1924 the measures adopted to control the disease were fairly successful (*see* Table III.), but in November of that year the disease got out of hand, and in the following month over 6,000 outbreaks occurred.

The bare figures in the right-hand columns of Tables III. and IV. are eloquent of the calamity that would have overtaken animal husbandry in this country if the stamping-out policy had been abandoned in 1922, and which may yet overtake it if stockowners conceal the existence of the disease or neglect to give prompt notification of suspicious symptoms in their animals.

In view of the incompleteness of the information obtainable regarding outbreaks only an approximate estimate can be formed of the loss inflicted by the disease in foreign countries, but one is on much firmer ground when endeavouring to calculate what it would have cost this country if it had had in 1925 as many outbreaks as Denmark, *viz.* in round numbers 53,000. Judging from the experience of the last four years, each of these would have involved sixty-seven animals, or a total of over 3½ millions, and, on the well-founded calculation that 3 per cent. of these (valued at £15 per head) would have died, and that the deterioration of the remainder would have averaged £3 per head, the total loss inflicted directly on the owners in one year would have been over 10½ million pounds.

This should be measured against the £270,000 which the State paid during the year to prevent what has occurred in Denmark.

And, in conclusion, it must be pointed out that, in consequence of the consistent application of the stamping-out policy, this country continues to have an infinitely better prospect than any of those in which measures of isolation are employed to prevent the spread of the disease.

The experience of the past year gives good ground for expecting that in this country the disease will not again make the alarming headway that it did in 1923 and 1924, but the figures for the other countries hold out no hope of any improvement in the near future.

Actinomycosis Successfully Treated by Iodine in Milk.

Mr. W. D. Connochie, M.R.C.V.S. (Selkirk), writes to the *British Medical Journal* (*B.M.J.*, No. 3,406, p. 682) :—"I have read with some interest the article in your issue of March 6th (p. 418) by Mr. Hubert Chitty on actinomycosis successfully treated by iodine in milk. We as veterinarians have for long regarded iodine as more or less of a specific in actinomycosis in animals. Personally I have used it with invariable success in the shape either of liq. donovani or of hydrarg. iodid. rub. ; the latter dissolved in a solution of potass. iodid. Whether the arsenic and mercurial content of the one and mercurial of the other has any contributory effect or not I am unable to say categorically, although the antiparasitic and penetrating action of both might well be complementary and auxiliary. Generally speaking, the improvement noticed in those cases most usually met with—namely, lingual actinomycosis (woody tongue), with its invasions of the jaw and facial bones—is nothing short of marvellous, even if of long-standing and malignant degree. Given in fairly heroic doses, I administer either only in a little cold water, and being both odourless and tasteless the administration is easy. Their colloidal exhibition in milk might be an improvement, and at the first opportunity I will give the iodine as recommended by Mr. Chitty a trial, either in the form of tincture or Lugol's solution, and will compare the results."

The Veterinary Record.

17th April, 1926.

THE PRESENT MILK REGULATIONS (SCOTLAND).

With the coming into operation of the Tuberculosis Order and the Milk and Dairies Acts in September of last year a permanent impetus, unparalleled in our time, was given to the call for veterinary services throughout the whole country. These measures are giving the veterinary profession an opportunity of performing work pregnant with far-reaching results in the domain of public health—work that must carry the stamp of professional skill and reveal our capacity to co-operate tactfully with other officials. The Tuberculosis Orders of 1913 and 1914 brought veterinary service into some prominence, but until now the utilisation of veterinary service by county local authorities in the realm of milk has been almost a dead letter.

The scene is now changed, and county local authorities are setting their houses in order to give loyal effect to the new legislation. At such a time when, in Scotland alone, no fewer than seven new whole-time veterinary departments have been created within six months, making the total in Scotland ten in all, it was most opportune that the Scottish Metropolitan Division should have had the advantage of the paper by Mr. McAllan on "A Resumé of the present Milk Regulations (Scotland)," which is published in this issue of the *Veterinary Record*.

As a resumé, Mr. McAllan's paper is excellent throughout, though perhaps some who attended did expect a wider treatment of his text that would have lent some spice to his array of detailed quotations from the Acts and Orders. Good judgment characterised the few personal opinions he offered, but of suggested amendments there was scarcely a word.

In the few sentences wherein reference was made to the Tuberculosis Order, he expressed the view that in many places the Order is sadly misunderstood and the difficulty in working it greatly exaggerated. Perhaps he has taken his evidence too seriously. It is characteristic of those who strive for perfection in their work to expose in order to improve the irksome places revealed by their careful methods, but that does not spell incapacity—rather the opposite. Mr. McAllan's view that *veterinary surgeons ought to control the conditions under which animals live* will appeal to our readers and to stock-owners in general. This power is not vested in the veterinary inspector under the Act, and the medical officer of health, as chief administrator, may never delegate this duty, notwithstanding our fitness for it and despite the resentment of dairy farmers to the presence of a medical man in the cowshed. Byelaws framed under the Act and passed by the Board of Health may contain a misleading provision to the effect that the veterinary inspector will be required to give his advice on such plans as may be submitted to him, but whether any will be submitted is another question. We trust Mr. McAllan's hint will receive the consideration it deserves at the hands of the Scottish Board of Health.

It transpired, particularly from the discussion, that other sections of the Acts and Orders stand in need of amendment, but this portrayal is not to be regarded as condemnatory of what we all deem to be most praiseworthy legislation. Moreover, while Dr. Leighton, who deserves much credit, reminded us that there would probably be no more call for new acts for twenty-five or even for fifty years, he admitted that alterations would be made when and where necessary. But he must recognise that it is chiefly through criticism, suave or blunt, that he can get to know the views of men engaged in the field. Such criticism is meant to be helpful.

Mr. Rabagliati very properly called attention to the difficulty involved in Section 13 of the Milk and Dairies Act. What about the "weeded cow"—the animal that may be yielding three or four gallons of milk daily from her unaffected quarters, while the product of the abnormal quarter may contain streptococci for many weeks on end? The culpability of such an animal under this section should be precised both in the early stage of her complaint and later when, in the absence of constitutional disturbance, streptococci can still be determined microscopically in the secretion of the altered quarter.

We trust that Mr. McAllan's paper and the debate thereon will afford some inspiration to those whose privilege it is to make amendments in our present Milk Regulations.

A De-Rusting Process in which Acids and Alkalies are Eliminated.

The following method of removing rust from instruments was furnished to the U.S. Army Veterinary Corps *Bulletin* by Captain George B. West:—Prepare a solution of ammonium citrate, one tablespoonful to one-half pint water, using a sufficient quantity to cover completely the objects to be treated. The instruments are immersed in this solution for about ten to twelve hours, depending upon the extent of rust. They are then removed, rinsed in water and oiled. The solution can be used over and over until depleted. If desired, the instruments may later be placed in a solution of potassium chromate for from ten to twelve hours, which will tend to remove the dark colour and brighten the articles, and also check further rusting.

Erratum.—On line 15, second column, page 327 (first page) of last week's issue, for "ever" read "even," the sentence to read "The history of war through many centuries has clearly shown that war was *even* dominated by the power of the horse," not "was *ever* dominated."—J. M.

TRANSLATION.

Immunisation against Foot-and-Mouth Disease by Virus Formolé.

By M. M. H. Valleé, H. Carré and P. Rinjard.

In a note presented to the Central Society of Veterinary Medicine in July, 1925, we outlined the importance of obtaining a method of vaccination against foot-and-mouth disease by using killed virus. At the same time, we recalled the research work done by Loffler and Frosch, Behla, Bedel, Leclercq and Nicodème and by Terni. We also pointed out that if all the efforts made had not arrived at success it would be wrong to set aside all hope of ever being able to vaccinate animals against foot-and-mouth disease under certain conditions, by using antigens deprived of all virulence. We then specially indicated that an aphthous virus killed by adding formalin to it, if used in large doses, is capable of creating in susceptible bovines a condition refractory to aphthous infection. Small doses of killed virus are powerless to produce this desired result. To-day we submit the results of new attempts at vaccination carried out either with our viruses O and A, considered separately, or with the two virulent forms used together.

I. Preparation of Vaccin Formolé.

In order to assist research workers who pursue the study of foot-and-mouth disease to take up and continue attempts similar to ours, we give, with all the accuracy necessary, the results of our experiences.

For the reasons indicated in our previous note, we only used as a source of aphthous virus shreds of epithelium derived from mouth lesions. The classic reports relative to certain non-success with similar lesions, the facts quoted by our colleague and friend Lebailly, and confirmed by ourselves and other research workers, conduced us to utilise only the aphthous epithelium from lesions *which had not ruptured or only recently ruptured* as, if not collected at this stage, the shreds contain very little, if any, virus—therefore, the necessary quantity of virus is not obtained.

The collected shreds with which we experimented were preserved in a cold chamber at a temperature of 0°C. until we required them, but they can also be preserved by placing them in a mixture composed of equal parts of neutral glycerine and physiologic solution. This mixture preserves them sufficiently long to enable them to be transported from a distance to a laboratory. The aphthous shreds are first weighed, then cut very finely with scissors, then ground up in a mortar for a long time with a little physiologic solution and a small quantity of sandstone. A perfect trituration having been obtained, a little more physiologic solution is added to the pasty mass and the whole then filtered through very fine linen. Dilution is completed by adding more solution until the necessary volume is obtained by using the last part of the liquid for rinsing the virulent paste remaining in the filter; by this method the greater part of the virus contained in the shreds is obtained. The dilution is then such that it is equal to 10 c.c.'s of liquid for every 30 centigrammes of aphthous shreds treated. Lastly, there is added to the virulent diluted mass 0·20 c.c. of an aqueous solution (one in four) of formalin for every 10 c.c.'s of filtrate obtained. The vaccin is shaken for a long time and preserved away from the light for at least forty-eight hours.

Two controls of the product are then made before it is used: one to ascertain the richness or power of the dilution before the formalin is added, the other to test the sterilisation od the product after addition of the formalin.

The first is carried out by taking a small quantity of the virulent fluid, this is again diluted to one in one hundred by adding physiologic solution and an intra-plantar inoculation is made into a guinea-pig with $\frac{1}{20}$ c.c. of the latter solution, which should produce a specific lesion. The second is carried out by a natural inoculation, without any dilution of the product, as described above, forty-eight hours after it has been obtained.

This test should prove negative.[1] It was on those lines our experiments were conducted.

II. Monovalent Vaccination against Virus O.

Beginning with aphthous lesions not yet ruptured and collected at once, a vaccin formolé is prepared according to the directions already given.

The vaccin was preserved away from the light at an average temperature of 20°C. for seven days, then inoculated in a dose of 10 c.c.'s (equal to 30 centigrammes of epithelium) subcutaneously behind the shoulder into two heifers Nos. 378 and 379. The operation did not provoke any appreciable local effect or hyperthæmia. Thirty-one days after this attempt to vaccinate, the heifers thus treated were tested and at the same time one of the same lot of heifers similar in height and from the same district (No. 366) by subcutaneous inoculation with 10 c.c.'s each with virulent blood O. The control heifer (No. 366) was infected fifty hours after the virulent test whilst the vaccinated heifers (Nos. 378 and 379) remained without any evidence of reaction.

III. Monovalent Vaccination against Virus A.

Under exactly similar conditions, a vaccin formolé was prepared from aphthous shreds freshly collected from an animal infected by Virus A. The vaccin was preserved away from the light for four days before it was used with doses as previously stated; this vaccin was subcutaneously injected into five heifers (Nos. 365, 369, 370, 371, 381). No reaction was observed in any of them. Twenty-six days after the attempt to vaccinate we proceeded to test if immunity had been conferred by inoculating subcutaneously into each of the vaccinated heifers and also into two controls (heifers Nos. 367 and 368) 10 c.c.'s of virulent blood A. The two control heifers were infected in five days. The test was then doubled by taking material from the

[1] For each test there are four guinea pigs used.

controls and rubbing it into the mouths of the vaccinated heifers. They all remained without any reaction to the double test to which they had been subjected.

IV. Bivalent Vaccination against O and A.

Without modifying in any way the conditions already described, we prepared a bivalent vaccin against O and A (30 centigrammes of each epithelium per dose). The vaccin was preserved away from the light at a temperature of 20°C. for forty-eight hours, then inoculated; 1st, subcutaneously a dose of 20 c.c.'s (*i.e.*, 60 centigrammes of epitheliums O and A $\overline{aa}$) into the heifers Nos. 384, 385, 386, 387, 388, 389; 2nd, intradermally in eight different points with a total dose of 2 c.c.'s per head into the heifers 390, 391, 392, 393.

In none of the subjects was there any reaction that merited notice.

We then proceeded to test for immunity.

First Test.—Twenty-six days after the vaccination we tested with Virus O by inoculating subcutaneously with 10 c.c.'s of virulent blood the heifers vaccinated subcutaneously, viz., Nos. 384, 385, 386, also Nos. 390 and 393, and at the same time the control heifer 372. This control became infected in four days and those vaccinated intradermally (Nos. 390 and 393) were also infected in five and six days. No. 385, vaccinated subcutaneously, was also infected on the sixth day, whilst the heifers Nos. 384 and 386 resisted not only the first test to which they had been submitted but also to co-habitation with Nos. 385 and 390.

Second Test.—Thirty-four days after vaccination we tested for proof of immunity with regard to Virus O, by inoculating 10 c.c.'s of virulent blood into each of the heifers Nos. 387, 388, 389, vaccinated subcutaneously, also into the heifers Nos. 391, 392, vaccinated intradermally and into the control heifer 398. This last subject became infected in three days and at the same time heifer No. 392 was infected. All the other animals resisted the test, although we had taken steps to increase their chances of infection by attempts to infect them by the mouth.

Third Test.—Lastly, forty-eight days after vaccination all the vaccinated animals were tested by subcutaneously inoculating 10 c.c.'s of virulent blood A into them and at the same time heifer No. 309 as a control—which we knew to be like those tested—refractory to Virus O. On the fifth day the control was affected with severe aphthous fever. The ten vaccinated heifers definitely resisted the test.

To sum up, in this attempt of bivalent vaccination, out of six bovines vaccinated subcutaneously only, one reacted to the test by Virus O, and none to the test by Virus A. On the contrary, the vaccination done intradermally—in which only one-fifth of the vaccinal dose was used—showed that it was insufficient, one subject only out of four having derived any benefit against Virus O. All, however, showed that they were refractory to Virus A. Has the method of introducing the vaccin any bearing on the results? New research work on this question is necessary.

Conclusions.

All our experiments were carried out on Breton heifers acquired on farms specially selected. The question of a natural immunity must be kept in mind and we cannot omit the fact that a natural immunity may have existed in some of those animals which we vaccinated. We would, however, remark that all the other subjects from the same origin and of the same lot have regularly showed themselves susceptible to Viruses A and O. It is exceptional that we encounter heifers refractory either to one or other of those viruses. We hope, then, that we have not been in our experiments the unfortunate players in a game of chance which some other research workers have experienced, and we guard ourselves against this criticism—*viz.*, having vaccinated animals which already possessed a natural immunity. We also hope our attempts will be repeated by other workers. This we desire all the more earnestly, having received at the research laboratories our colleagues from the United States of America who are charged with a mission to study foot-and-mouth disease. We, for a time, interrupted our researches in order to facilitate theirs.

No doubt a number of research workers may attempt to undertake with guinea-pigs experiments similar to those carried out by us on bovines. Let us dissuade them from doing so. While carrying out the experiments we have reported, we at the same time inoculated our vaccin formolé into a series of guinea-pigs. In every case there was no concordance between the results obtained in the bovines and those observed in the guinea-pigs. For example, twenty-three guinea-pigs out of twenty-seven vaccinated by the bivalent method remained susceptible to Virus O and in the test by Virus A on nineteen vaccinated guinea-pigs still alive nine only were infected. All one can say about those tests is that the results were unsatisfactory. In our opinion, all essential researches on foot-and-mouth disease should be carried out on bovines.

(Per *Revue Générale de Médicine Vétérinaire* et Laboratoire de Recherches des Services Vétérinaires. Institut des Recherches agronomiques). T. D. Y.

CLINICAL REPORT.

Diaphragmatic Hernia.

By R. G. Anderson, F.R.C.V.S., Cupar, Fife.

This condition is of sufficiently frequent occurrence to call but seldom for special comment.

The following *post-mortem* results may, however, have a somewhat special interest and point to a cause of greater frequency than has been supposed.

The subject was a four-years-old Clydesdale gelding.

My attention was drawn to the case by the owner of the knacker's yard to which the carcase had been removed. The case had not been seen by me in life. He 'phoned that a carcase, on being opened, showed a strange and unusual condition in the abdominal cavity.

The description caused me to venture an opinion that it was a case of diaphragmatic hernia, but he thought not, and the impression given was that a piece of bowel had passed through the parietal peritoneum without external signs of hernia. On examination, a diaphragmatic hernia through the right side of the diaphragm was revealed.

The hernial ring was small, but well-defined, after extraction of about nine inches of small intestine and mesentery. Clearly, the occurrence was not due to recent violence or exertion, and examination was made of the chest wall.

This revealed a well-defined callus at the junction of the middle and lower thirds of the fifteenth rib. There was no known history of an accident to have caused this fracture, and it is recognised that such may occur and cause no inconvenience.

The hernia would thus seem to have been caused by a gradual process of attrition of that portion of the diaphragm abutting on the callus formed after the fracture, until a small opening occurred which allowed a fragment of mesentery to percolate through, to be followed by more of the mesentery and later of bowel, this latter probably quite of recent occurrence. Communication with the attending veterinary surgeon gave no history of unusual symptoms.

REVIEW.

Chronic Infection of the Jaws, by STANLEY COLYER, M.D., Lond., M.R.C.P., etc.; pp. 76, with 25 radiographic photographs illustrating the teeth and their alveoli. London: H. K. Lewis and Co., Ltd., 1926).

As chronic infection of the jaws, commonly termed pyorrhœa, is the most prevalent disease of adult dogs as it is of adult man, this small work, written concisely and lucidly by an expert versed in dental pathology and radiology, should appeal to the veterinarian as much as to the medical man.

By a close perusal of its pages the practitioner may gain a great deal of information that is likely to enlighten him upon many points that may arise in his mind when studying the affection in animals.

The author, when speaking of the gross structural changes pertinently remarks: "Always we must bear in mind that these changes are *not rapidly produced, but are the result of months or years of infection.*"

Besides wishing to make a comparative study of this widely spread malady, the veterinarian may desire to know something about it so far as it concerns himself. Probably 85 to 90 per cent. of veterinarians suffer from the disease and unless they have some knowledge of how it affects man they may not be in a position to seek advice before its ravages become far advanced.

At all events, with the abundance of material always around him the veterinarian should, by studying the effects and determining its cause in his own patients, be able to help in the advancement of the general knowledge of its causation with a view of preventing, or at least lessening, its occurrence in mankind, for it is a preventible disease.

(Continued at foot of next column.)

ABSTRACTS.

["The Maintenance Requirement of Dry Cows." D. C. COCHRANE, J. A. FRIES and W. W. BRAMAN. *J. Agric. Res.*, 31; 1,055 (1925).]

The net energy required for maintenance by three dry cows was determined in a series of respiration calorimeter experiments to be 4·150, 5·470 and 5·566 therms respectively per 1,000 pounds of live weight. The lowest value (4·150) is ascribed to the individuality of the subject, which was a cow of unusually quiet disposition. The other two figures do not differ materially from those previously obtained for steers.

In the experiments recounted, there were gains of energy by all three subjects on rations computed to supply the maintenance requirements in accord with the six-therm average (previously obtained for steers).

The net-energy value of a ration composed of 40 per cent. alfalfa hay and 60 per cent. grain mixture, the latter consisting of thirty parts wheat bran, thirty parts ground oats, thirty parts corn meal and ten parts old process linseed meal, was found to be 1·418 therms per kilogram of dry matter of the ration, as determined by direct measurement of the heat production of the animals.

A method of approximating the apparent digestibility of a ration where it is impracticable to collect the dung and urine separately is reported.—W. R. W.

[Inactivation of Vitamin A by Rancid Fat. W. C. POWICK. *J. Agric. Res.*, 31; 1,017-26 (1925).]

Three experiments with rats bearing upon the characteristics of rancid lard as a food are reported. The lard used was more intensely rancid than would anywhere have been tolerated for human consumption, and possibly more rancid than would be acceptable for animal feeding. It was also employed in larger proportions than those in which fat is generally used in the rations of man or beast. The results may be summarised as follows:—

Under the conditions of these experiments, rancid lard, although clearly inferior to sweet lard as a ration component, did not seem to be actually toxic to the white rats receiving it.

The inferiority of rancid lard as a food product appeared to be due to its ability to destroy the vitamin A of the rations with which it was admixed. This destruction appeared to occur gradually over a period of several days and was presumably due to the oxidation of the vitamin A by the organic peroxides of the rancid lard.

When the vitamin A was fed separately from the lard, the males receiving the rancid lard seemed to require more vitamin A than did males receiving a corresponding ration containing sweet lard.—W. R. W.

(Continued from previous column.)

To those who wish to study its effects, course, or cause in animals, we can thoroughly recommend this book.—H. G.

REPORT.

Annual Report of the Civil Veterinary Department, Bihar and Orissa, for the year 1924-1925.

The report of the Civil Veterinary Department in this Province has been received and, in common with that of other Provinces, it shows the uphill work of a small, imperfectly-equipped Department in its struggle against the ravages of diseases which, to a large extent, are reasonably preventible. The Secretary to the Government of the Province (Ministry of Education) aptly sums up the situation in the last paragraph of his covering note to the report :—" There can be no doubt that the Department has in no sense yet reached its limit of usefulness ; indeed, it might almost be said that only a beginning has been made. Much still remains to be done and it is earnestly hoped that local bodies and all concerned will grasp the importance of the subject and ensure a more rapid rate of progress."

There is nothing in the report to guide one as to the total number of animals in the Province for veterinary supervision and care, either collectively in the sub-divided three Ranges (Central, North Bihar and Orissa) or specifically under the control of municipalities or local bodies. Disease to the following extent was reported :—

Cattle—

Rinderpest, 34,193 cases with 13,473 deaths.

Foot-and-mouth disease, 78,725 cases with 570 deaths.

Hæmorrhagic septicæmia, 7,911 cases with 5,915 deaths.

Black quarter, 97 cases with 81 deaths.

Anthrax, 140 cases with 117 deaths.

Other contagious diseases, 289 deaths.

Dogs—

Rabies, 64 deaths.

Horses—

Glanders, 1 death.

Surra, 25 deaths.

Other diseases, 6 deaths.

Treatment carried out—

(a) In Veterinary Hospitals (29 Veterinary Assistant Surgeons).

In-patients	2,923
Out-patients	33,194
Supplied with medicine ...	6,199
Castrations	1,061
	43,377

(b) On Tour (80 Veterinary Assistant Surgeons).

For contagious disease ...	27,491
For non-contagious disease ...	43,032
Castrations	370
	70,893
Villages visited	35,381

Inoculations—

For rinderpest	106,368
For hæmorrhagic septicæmia (serum)	51,471
Ditto (vaccine)	1,041
For anthrax (serum) ...	1,174
For black quarter	203
	160,257

The strength of the Department was as follows—

One Director C.V.D. and Veterinary Advisor to the Government of Bihar and Orissa (was also Deputy-Director of Central Range).

Two Deputy Directors : North Bihar Range (in existence four years) ; Orissa Range (new range).

Two Assistant Directors (Provincial Service).

Eleven Veterinary Inspectors.

One hundred and fifteen Veterinary Assistant Surgeons, including Laboratory Assistants and Reserve Veterinary Assistants.

A State scholar is at the Royal Veterinary College, London : he has been permitted to take the B.Sc. degree in Veterinary Science at the London University.

Training and Research.—Up-to-date, the Province has sent young men to Belgachia College, Calcutta, for training, but as this College has never been popular with Bihari students, and the number of graduates passed out being insufficient to meet sanctioned posts, it has been decided to put forward a scheme for the establishment of a Veterinary College within the Province, at Patna. A research station and a dairy farm will form part of the scheme.

It is pleasing to note that local bodies appear to be taking an interest in the improvement of cattle, and to meet the wishes of the people a committee has been formed to go into the whole question of the cattle industry. There are great possibilities in milk supply to Calcutta. The establishment of Government farms and of co-operative dairies under competent management is considered the best and most economical method to accomplish the desired improvement.

J. M.

Medical Students in 1925.—During 1925, 1,070 medical students were registered by the General Medical Council ; of these, 496 were registered in England, 410 in Scotland, and 164 in Ireland. The figure for 1925 is slightly more than that for the previous year and is nearly twice as high as that for 1923, the lowest on record. With the exception of those two years, the registrations in 1925 are the lowest yet received. In 1905, over fourteen hundred students were registered, which figure remained the average until the outbreak of war. The registrations thereafter increased enormously, until in 1919 the peak figure of 3,420 was reached. The next year registrations declined by nearly a thousand, and in 1923 the abnormally low figure of 545 was recorded. The total number of students registered since 1865 is 97,237, of which 33,624 were registered in the last twenty years. Over 100 of the students registered for 1925 were women.

DIVISIONAL REPORT.

Western Counties' Division.

Annual Meeting at Exeter.

The Annual Meeting of the Western Counties' Division was held at the Royal Clarence Hotel, Exeter, on March 17th. Mr. Chas. Masson, Torquay (President), occupied the Chair, and there were also present the following members: Messrs. W. Ascott (Bideford), W. Fyrth (Bridport), W. B. Nelder and E. R. Edwards (Exeter), E. W. Bovett (Bridgwater), G. H. Gibbings (Tavistock), W. N. Wright (Torquay), W. G. Blackwell (Exmouth), J. P. Penhale (Barnstaple), R. E. L. Penhale (Torrington), E. Thorburn (Crewkerne), L. Norman (Chudleigh), H. K. Roberts (Sampford Peverell), P. W. Bloye (Plymouth), and R. Barons Nelder (Exeter), Hon. Secretary and Treasurer.

Visitors.—Messrs. J. Cochrane-Dyet (Wiveliscombe), H. L. Hobson (Honiton), and C. E. Perry (Bristol).

The minutes of the last meeting, as published in *The Record*, were taken as read and were confirmed and signed as correct.

Correspondence.—(1) Apologies for absence were announced from the following: Major Hobday and Messrs. J. Dunstan, E. R. Smythe, W. Penhale, R. H. Penhale, S. J. Motton, W. Roach, A. G. Saunders, F. T. Harvey, E. C. Bovett, R. Ferris, W. H. James, C. G. Hearn.

The President and the Hon. Secretary of the Mid-West and South Wales Division also wrote regretting their inability to be present.

(2) A letter from Mr. G. D. Lansley, thanking the members for their congratulations on his appointment as a Justice of the Peace, and intimating that he would like to see other members of the profession on the Bench, as there were many who would be of value.

(3) Resignations from Mr. W. Brown, late of Wiveliscombe, and Mr. B. J. M. Nairn, Honiton. Mr. Brown wrote and said that, having left the district and practically retired, he was afraid that he must sever his long connection with the Western Counties. Mr. Nairn has left Honiton and has proceeded to Morocco. Both resignations were accepted with regret.

(4) A letter was read from the National Association, expressing thanks for a subscription of £2 towards the official Chain of Office.

(5) A further letter from the "National" had reference to the holding of Branch Meetings and the question of securing the greatest possible efficiency of the Association. The "National" were of opinion that regular periodical meetings of branches were eminently desirable and suggested that, if the plan met with approval, the Presidents and Secretaries of Branches and Divisions should confer together with a view to making the necessary arrangements.

Bearing on the subject, a letter had also been received from Mr. W. D. Rees, Hon. Secretary of the Mid.-West and South Wales Division, stating that the holding of a Joint Meeting of the two Divisions was discussed at the last meeting of their Division and that further consideration was deferred in view of a statement of the Hon. Secretary of the Southern Branch, that it had been suggested that a Branch meeting might be held once a year, although he realised the difficulty of making such a meeting a success.

Major Ascott said it occurred to him that if a joint meeting of the Mid.-West and South Wales and their own Division was held, the meeting was very likely to become a failure. They would be bound to hold it at an intermediate point, say Taunton, which would mean that anyone from the South of their Division and from the extreme end of the Mid-West and South Wales Division, was barred from attending and practically everyone would have to stay away for one night. It might also trespass on the "National."

The Hon. Secretary said he did not think the proposal would be a success. It would mean that the Western Division would have only two meetings a year.

The Chairman informed the gathering that at a meeting of the "National," at which he was present, the question was thoroughly discussed. It was felt that Branches were not functioning, but ought to function and that it would be good for everyone concerned. His point was that it was too much to ask the Southern Counties to go to Cornwall or *vice versa*. and that it would be a good thing for the Divisions to hold a joint meeting.

The Hon. Secretary expressed the opinion that Branches were never intended to function; they were just simply geographical Divisions.

The Chairman pointed out that the Scottish Division were having successful meetings.

Mr. P. W. Bloye suggested it would be better to have a County Branch meeting. The Division covered three counties.

Mr. Bovett said that owing to distance a number of members had to forego one meeting at present.

Mr. Perry (of the Mid.-West and South Wales Division), explained that they went thoroughly into the question at their last meeting. They found it difficult to get their own members together, a part of them being in South Wales and a part in English counties. If they joined with the Western Counties in a joint meeting he did not think it would be a success.

Major Ascott considered that if effect was given to the proposal it would mean an extra meeting.

The Hon. Secretary was asked to reply to the "National" to the effect that, while the Association was in sympathy with the proposal, they considered it would not be practicable.

(6) A letter from a member, concerning the destruction of animals by a humane society, was after some discussion allowed to lie on the table.

(7) Acknowledgment and thanks for subscription to the Garnett Memorial Fund and the report from the Field Distemper Fund were also presented.

(8) Correspondence with the Devon County Council was considered regarding Veterinary Inspectors' Fees, and the Hon. Secretary was instructed to keep in touch with them with a view to obtaining arrears due to certain members.

Election of New Members.—The following new members were elected: Major J. Cochrane-Dyet, Wiveliscombe, proposed by Mr. W. BROWN, seconded by the HON. SECRETARY.

Mr. E. R. Tazewell, Castle Cary, proposed by Mr. W. B. NELDER, seconded by the HON. SECRETARY.

Nomination of New Members.—The following gentlemen were nominated for election as members: Mr. J. Forbes, Truro, and Mr. H. L. Hobson, Honiton.

The Treasurer's Financial Report and Balance Sheet.—Mr. R. BARONS NELDER presented the following report, and moved its reception and adoption:—

I have much pleasure in placing before you the Accounts for the year 1925. The finances of this Association are gradually attaining a sound position and the present, my fourth balance sheet, is the best I have placed before you. Nevertheless, we have nothing to brag about and we must endeavour to build up, as time goes on, a little reserve fund and, until this is a reality, I do not think we should be satisfied, as at times all sorts of expenses crop up, which have in some years sent up the expenditure very considerably.

Most of the expenses this year are about the same as usual; the printing bill is, however, heavier, due to the special meetings that have been held in connection with the arranging of the charges for veterinary inspectors under the C.D.A. Acts, which have been more than justified because satisfactory fees have been agreed upon. In this connection I may add that the county with which we anticipated the greatest difficulty has proved the most tractable. The same reason accounts for the slight increase for the hire of rooms and postal expenses. The remainder of this side of the accounts calls for no further special comment, except that we were very pleased to contribute towards the Presidential Chain of the N.V.M.A.

The receipts show an increase, due to our increased membership, we now have fifty members compared with forty-five of a year ago, this I believe to be a record number.

There is, I am pleased to say, only one member in arrear of subscription, which I think is very satisfactory and I hope other Divisions can report a similar state of affairs.

The outstanding indebtedness is, therefore, only half-a-guinea. The total receipts amount to £36 5s., whilst the total expenditure is £21 5s.1d., leaving a balance in hand of £14 19s. 11d.

The Treasurer's motion was seconded by Mr. R. E. L. PENHALE, and the report, which was considered highly satisfactory, was adopted.

ELECTION OF OFFICERS.

On the proposal of the CHAIRMAN, seconded by Mr. THORBURN, Mr. A. G. Saunders, of Taunton, was elected *President* for the ensuing year. The *Vice-Presidents* elected were Messrs. Motton, Bloye, E. W. Bovett and the retiring President. Compliments were paid to the work of the *Hon. Secretary and Treasurer*, who was re-elected and expressed his willingness to continue for another year. The *Council*—Messrs. Bloye, K. H. Roberts, Edwards, and the Hon. Secretary—were re-elected, with the addition of Mr. Masson, and Mr. Edwards was appointed *Auditor*.

It was decided to hold the next meeting at Taunton.

THE WORKING OF THE TUBERCULOSIS ORDER.

An instructive and illuminating discussion on "The Working of the Tuberculosis Order, 1925," was opened by Major ASCOTT who, at the outset, confessed that when two veterinary surgeons got together, they were pretty sure to have differences about the Order, and explained the difficulty in discussing the working of the Order without discussing the Order itself. He pointed out the difficulty of interpreting certain sections and remarked on some of the apparent anomalies, but admitted that the explanatory letter of the Ministry made clearer some of the points on which they were in doubt. Had the letter been issued earlier, it would have avoided a good deal of misunderstanding.

Major ASCOTT said: The Order has been in force long enough now for us to have become familiar with it and I am not sure there is so much to discuss as we thought at first. However, I propose to open the discussion by examining the Act *seriatim* and criticising it as well as its working.

(*To be continued*).

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

April 20th.—Meeting of the North Midland Division at Sheffield.
,, 22nd.—Meeting of the Lancashire Division at the Grand Hotel, Aytoun Street, Manchester.
,, 30th.—Meeting of the Royal Counties Division at Weybridge.
May 7th.—Last day for nominations for election to Council, R.C.V.S.
,, 21st.—R.C.V.S. Annual Report and Voting Papers issued.
,, 26th.—Entries for D.V.S.M. Examination due.
,, 27th.—Last day for return of R.C.V.S. Voting Papers.
June 3rd.—R.C.V.S. Annual General Meeting.
,, 21st—26th.—D.V.S.M. Examination.
,, 30th.—R.C.V.S. Annual Dinner, Hotel Victoria, London, 7-30.
July 1st.—R.C.V.S. Committee Meetings.
,, 2nd.—R.C.V.S. Committee and Council Meetings.
,, 9th.—R.C.V.S. Written Examinations.
,, 13th.—R.C.V.S. Oral Examinations commence in London.

July 27th-30th.—N.V.M.A. Congress at Dublin.

Animal Diseases Research Association.

At a meeting of the Directors of the Animal Diseases Research Association, held at the offices of the Highland and Agricultural Society, Edinburgh, on the 6th inst., Mr. W. A. Pool, M.R.C.V.S., was appointed to the post of Director of Research, rendered vacant by the resignation of Professor Gaiger.

Mr. Pool, after graduating from the Royal Veterinary College, London, and holding the appointment of hospital surgeon, was appointed in 1912 to the Indian Veterinary Service, in which he remained for ten years, holding laboratory and research appointments at the Punjab Veterinary College, Lahore, and the Imperial Bacteriological Laboratory. He studied for two years in Cambridge and at the Pasteur Institute, Paris, and in 1924 was appointed Senior Research Assistant to the Animal Diseases Research Association under Professor Gaiger.

Cattle Tuberculosis Rapidly Reduced by Area Plan.

"Carrying the campaign of eradicating animal tuberculosis to areas where it is very strongly entrenched is," says the March issue of Chicago *Veterinary Medicine*, "one of the newer developments in the nation-wide programme to rout the disease. A survey just completed by the Bureau of Animal Industry, United States Department of Agriculture, shows the aggressive action taken by many counties.

"The eradication of tuberculosis under the 'area' plan is now being conducted in 34 of the 98 counties having more than 15 per cent. of tuberculosis infection among cattle, and in 54 of 165 counties containing cattle that are tuberculous to the extent of more than 7 per cent. but not more than 15 per cent. Thus, about one-third of the most badly-infected counties have eradication work under way. Two of the counties, formerly very seriously affected, have already reduced the infection to 0.5 per cent. or less and are in the 'modified accredited area' class.

"There are 241 counties in the country where tuberculosis among cattle exists to the extent of more than 3 per cent. and up to 7 per cent. Of these counties 93 are conducting area work to eradicate the disease and 8 of them already have qualified as modified accredited areas. The work is also going forward rapidly in the more lightly affected areas where sentiment strongly favours eradicating the disease before it becomes more serious. At the beginning of 1926 the list of modified accredited areas totalled 149 counties, thus indicating excellent progress toward the conquest of the disease."

Personal.

Birth.—*Shipley*: To Mr. and Mrs. William Shipley, jun., of 158 Beccles Road, Southtown, a daughter.

The many friends of Major G. W. Dunkin, M.R.C.V.S., D.V.H., Superintendent of the Medical Research Council's Field Laboratories, Mill Hill, will regret to learn that a sudden attack of appendicitis rendered necessary the performance of an operation at 2 a.m. on Wednesday.

The operation was carried out at Hendon Cottage Hospital, and we are glad to be able to state that, at the time of going to Press, Major Dunkin's condition was satisfactory.

Morayshire and the Milk and Dairies Act.

At a meeting of the Public Health Committee of Moray County Council, held at Elgin, on April 5th, it was intimated that the Scottish Board of Health had now agreed to the Council's application for a modification of the Milk and Dairies Act Regulations, and to the Council's appointing their own veterinary inspectors as part time inspectors under the Act along with the sanitary inspector, with the proviso that before approving of the salaries to be paid, the Board be given some intimation of the amount of work to be done. At a subsequent meeting of the County Committee under the Diseases of Animals Act the foregoing arrangement was adopted, and the inspectors appointed as follow:—Mr. J. B. Russell, Elgin; Mr. G. S. Rutherford, Forres; and Major M'Vean, Craigellachie, with Mr. George Horne, County Sanitary Inspector.

East Yorkshire Farmers and Driffield Policy.

Mr. H. J. Winn, addressing the East Yorkshire Farmers' Union at Hull, recently, referred to the outbreak of foot-and-mouth disease, and the interest shown in the disaster by Mr. German, of the National Farmers' Union, who spent a week in the Driffield area along with representatives of the Ministry. They, he said, had rendered great service to the farmers by averting what might have been a catastrophe to the agriculturists of the country; the outbreak had been minimised as much as possible, but there was bound to be a terrible financial loss to the farmers.

There appeared to be an impression abroad that as soon as a flock was affected by disease all of the sheep were slaughtered, burnt, and buried. As a matter of fact, the only sheep detroyed were those actually affected. The sheep that were clean were slaughtered and sold for food. In this connection it was somewhat alarming to note that while the stocks in England were in the throes of the disease, cattle were being imported from infected areas in the Argentine, and landed at Zeebrugge, where they were slaughtered and sent to the fresh meat markets of England to compete with the produce of the British farmers. He hoped the Minister for Agriculture would keep an eye on this matter, and see that no risks were incurred by our own breeders.

The Editor acknowledges the receipt of the following:—Communications from Mr. W. L. Stewart, Captain J. F. D. Tutt and Captain U. W. F. Walker.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, "Veterinary Record," 10 Gray's Inn Square, W.C.1

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